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ABSTRACT

A study examined the relationships among communication predispositions and behaviors and learning preferences. It also assessed instrumentation adequacy for learning style preference. Subjects were 423 high school students who completed a battery of instruments, including D. A. Kolb's Learning Style Inventory (LSI), that measured their perceptions of their own communication predispositions, behaviors, and learning styles. The LSI measures an individual's relative emphasis on each of four learning style dimensions: (1) concrete experience, (2) abstract conceptualization, (3) active experimentation, and (4) reflective observation. Canonical correlation analysis indicated three significant variates relating communication and learning style. Multiple regression analysis indicated communication variables to be most important in predicting active experimentation, reflective observation, active participation, and active/passive orientation. Multiple discriminant analysis indicated that a linear composite of communication behaviors and predispositions can correctly classify 61% of the cases into one of the four LSI learning categories. (Author/FL)

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THE INFLUENCE OF COMMUNICATION BEHAVIORS AND PREDISPOSITIONS ON INDIVIDUAL LEARNING STYLE PREFERENCE

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Abstract

This research paper supplements the growing literature on individual learning style preference. Communication behaviors and predispositions which seem likely to be related to learning style preference were examined. Communication apprehension, shyness, unwillingness to communicate, tolerance for disagreement, communication immediacy, and communicator style were assessed using 431 high school students. Kolb's Learning Style Inventory and two newly created learning style preference instruments were also collected. Canonical correlation analysis indicated three significant variates relating communication and learning style. Multiple regression analysis indicated communication variables to be most important in predicting active experimentation, reflective observation, active participation, and active/passive orientation. Multiple discriminant analysis indicated that a linear composite of communication behaviors and predispositions can correctly classify 61% of the cases into one of the four LSI learning categories.

Traditionally, educators have generally subscribed to learning theories which assume that the learning process operates in similar ways for all students. Any deficiencies in learning outcomes have been attributed to deficiencies in motivation, devotion, or energy. This approach assumed a solely quantitative function for learning. More information, contact, exposure, study, or whatever would result in greater learning.

In the 1970s, literature began to emerge arguing for a more qualitative understanding of learning processes. The decade of the individual, or the "me decade," as it has been referred to in popular literature, brought with it a greater focus on individual learning style. The argument is that individual students have different learning patterns or cognitive styles that mediate learning processes and shape educational outcomes (cf. Blue, 1979; Demedio, 1978; Riechmann & Grasha, 1974; Stone, 1976). Sometimes more instruction, exposure, or study does not result in greater learning; it simply results in greater confusion and frustration.

The purpose of this paper is to further explore the individual learning style construct and to suggest some potential communication variables which might be predictive of learning style orientation. Student communication predispositions and behaviors are suggested as potential indicators of learning style preference.

Categorization of individual learning style variables is probably an infinite task. In fact, the proliferation of learning style variables and labels is likely to continue as long as the area remains popular and appealing. Daly (in press) summarized what he considered the major themes of research on learning styles. He classified learning style variables as being primarily related to intellectual ability differences, process and modality differences in learning, cognitive style differences, and noncognitive personality differences. All of these approaches yield numerous researchable variables fruitful to a better understanding of learning processes, and much of this research is noted in the Daly (in press) review.

A more general gestalt approach to student learning styles has also been suggested. These approaches measure and assess overall student learning styles along some central dimensions. For example, the Grasha-Reichmann Student Style Scale (Riechmann & Grasha, 1974) assesses six student learning styles: independent, dependent, avoidant, participant, collaborative, and competitive. Demedio (1978) describes the fundamental learning styles: the adventurer, the ponderer, and the drifter. Cawley, Miller, and Milligan (1976) report a cognitive style inventory which separates cognitive styles into analytic, relational, mixed, and conflicting style categories.

One of the most widely publicized learning style instruments is Kolb's Learning Style Inventory (Kolb, 1976a, 1976b; Kolb & Fry, 1974; Kolb, Rubin, & McIntyre, 1971; Lemoine & Rasberry, 1980). It may not be better or more predictive than any of the other learning style instruments, but it has captured more attention both rhetorically and empirically. For this reason, we chose it as the foundation for our learning style construct. It should be noted that all of the learning style instruments seem to have paid less attention to psychometric instrumentation issues than is desirable. In choosing the best instrument, one must currently rely more on intuitive appeal than on rational, empirically demonstrated criteria or compelling theoretical justifications.

The Learning Style Inventory (LSI) is derived from a conceptualization of the learning process as an experiential one, actively involving four cycles (see Figure 1). Kolb argues that there are four different learning abilities: (a) concrete experience--a receptive, experience-based approach to learning that relies heavily on feeling-based judgments; (b) abstract conceptualization--an analytical, conceptual approach to learning that relies heavily on logical thinking and rational evaluation; (c) active experimentation--an active, "doing" orientation to learning that relies heavily on experimentation; and (d) reflective observation--a tentative, impartial, and reflective approach to learning that relies heavily on careful observation in making decisions (Kolb, 1976a).

Learning is optimized when people move through the cycle by "becoming fully involved in, without bias, new, concrete, and personal experiences [concrete experience], which are followed by observation of, reflection on, and examination of the experience from many perspectives [reflective observation], which leads to creating concepts and generalizations that turn the observations into logically sound theories [abstract conceptualization], which are then used to test future action in future experiences and to make decisions in solving problems [active experimentation]" (Lemoine & Rasberry, 1980, p. 5).

Learning styles result from a primary emphasis on a combination of two of the learning abilities (see Figure 1). The four basic style types are labeled by Kolb as: (a) the converger, whose dominant learning abilities are abstract conceptualization and active experimentation; this person's greatest strength lies in the practical application of ideas; (b) the diverger, who is best at concrete experience and reflective observation; this person's greatest strength lies in imaginative ability; (c) the assimilator, whose dominant learning abilities are abstract conceptualization and reflective observation; the ability to create theoretical models is this person's greatest strength; and (d) the accommodator, who is best at concrete experience and active experimentation; carrying out plans and experiments and involving oneself in new experiences are this person's greatest strengths (Kolb, 1976a).

The LSI asks students to rank-order nine sets of descriptive labels potentially characteristic of their learning style. Using Kolb's idea of two major dimensions in learning, active/passive and concrete/abstract, two additional instruments with high face validity were created for this study. The first research question addressed the isomorphism between these learning style inventories:

RQ_1: What is the relationship between Kolb's learning style classification scheme and the newly created learning style inventories?

The second focus of this paper is concerned with communication correlates of learning styles. Hurt, Scott, and McCroskey (1978) describe some potential communication correlates of learning styles. Their descriptions are intuitively appealing but to our knowledge never empirically tested. This research, then, is an initial, exploratory investigation into the relationship between communication predispositions and behaviors and learning style patterns.

Communication predispositions are attitudes that individuals have toward engaging in communication activities. Since much of learning involves communicating, predispositions about communicating should alter preferences for learning activities. One of the most widely studied communication predispositions is communication apprehension (cf. McCroskey, 1970, 1977a, 1977b). Communication apprehension refers to an individual's fear or anxiety regarding real or anticipated communication. Individuals high in communication apprehension would be more likely to avoid active learning styles. Verbal ability (McCroskey & Richmond, 1980) and unwillingness to communicate (Burgoon, 1976) are two other similar predispositions which should affect learning styles in similar ways.

Tolerance for disagreement (Knutson, McCroskey, Knutson, & Hurt, 1979) is a recently operationalized communication predisposition which references an individual's ability to tolerate disagreement without taking it personally or becoming defensive or hostile. One might suspect that a person high in tolerance for disagreement might be a more active and/or abstract learner.

Communicator style (Norton, 1978) and immediacy (Andersen, 1979b) are two reports of communication behaviors which have been reliably and validly assessed previously. These instruments sample a broad domain of communication behaviors and therefore seem to be a good place to begin the exploration of the relationship between learning style and communication behaviors.

Immediacy refers to the communication of interpersonal closeness, friendliness, and an approach orientation (Andersen, 1979b; Mehrabian, 1971). Communicator style refers to the way one signals how meaning should be filtered or interpreted. The construct has 10 subcomponents, which are self-explanatory: open, friendly, animated, impression-leaving, relaxed, attentive, dramatic, dominant, contentious, and effective.

Thus these communication variables were examined for their interrelationships with learning style. As stated previously, this was a highly exploratory investigation. Other predispositions or behaviors could have been chosen, but these were chosen because they could be reliably measured, they represented a broad domain of communication variables, and they seemed intuitively related to learning patterns. The interrelationships between the communication process and the learning process argue strongly for a relationship between communication variables and learning style patterns. The exact nature of that relationship is yet to be determined. Therefore hypotheses 1 and 2 and research question 2 were advanced.

H_1: A linear combination of communication predispositions and communication behavioral reports will be significantly associated with a linear combination of learning style variables.

RQ_2: What communication predispositions and behavioral reports will be most predictive of learning style?

H_2: A linear combination of communication predispositions and behaviors will significantly discriminate among Kolb's four learning style categories.

Methodology

This investigation examined the relationships among communication predispositions and behavioral reports and learning style preference. It also empirically assessed instrumentation adequacy for learning style preference.

Subject Selection

The subjects were a random sample of students enrolled in English classes from 10 high schools throughout Harrison County, West Virginia (N = 423). The 10 teachers were chosen for participation in this study by the Harrison County Teacher Education Center. The teachers were asked to have their students complete a battery of self-explanatory instruments measuring the students' perceptions of their own communication predispositions, behaviors, and learning styles. All questionnaires were anonymous.

Measurement of Communication Predisposition

Communication Apprehension

Communication apprehension is a measure of an individual's fear or anxiety about oral communication. It was assessed by the 10-item Likert version of the Personal Report of Communication Apprehension (PRCA) (McCroskey, 1978). The PRCA has consistently yielded internal reliability estimates above .90 (McCroskey, 1977a).

Verbal Activity Scale

The Verbal Activity Scale is designed to assess self-perception of the amount of normative oral activity for the individual (cf. McCroskey, 1977a). Previous research reports that all Verbal Activity Scale items are factorially disctinct from items used to measure communication apprehension. The estimated split-half internal reliability for the 10-item Verbal Activity Scale was reported by Andersen (1979a) to be .85.

Unwillingness to Communicate

The unwillingness to communicate construct centers around communication avoidance. The avoidance may be based on fear or any other plausible motivation. The instrument is a 26-item Likert-type scale with a previously reported internal reliability of .88 (Burgoon, 1976).

Tolerance for Disagreement

The Tolerance for Disagreement Scale assesses an individual's ability to allow others to disagree without negative connotations or perceived conflict. The scale employed is a 20-item Likert-type instrument previously reported to have .90 internal reliability (Knutson, McCroskey, Knutson, & Hurt, 1979).

Measures of Reported Communication Behaviors

Immediacy

Immediacy behaviors signal warmth, approach, and positiveness. The immediacy construct was explained to the subjects, and they then completed the Generalized Immediacy Scale (Andersen, Andersen, & Jensen, in press). This scale is a nine-item semantic differential with previous internal reliabilities above .90.

Communicator Style

Communicator style assesses the way one verbally and paraverbally interacts to signal how literal meaning should be filtered. The instrument used was a 51-item Likert scale containing measurement for 10 dimensions of communicator style (Norton, 1978). Previous research reported internal reliabilities for the 10 dimensions as: friendly (.37), animated (.56), attentive (.57), contentious (.65), dramatic (.68), impression-leaving (.69), open (.69), relaxed (.71), communicator image (.72), and dominant (.82).

Learning Style Preference

Student learning style was assessed with three different instruments.

Kolb's Learning Style Inventory was utilized. As described earlier, this instrument measures an individual's relative emphasis on each of four learning style dimensions: concrete experience, abstract conceptualization, active experimentation, and reflective observation. Additionally, an individual can be placed into one of four learning style preferences based on a plot of two combination scores. The combination scores reflect the extent an individual emphasizes abstractness over concreteness and action over reflection. Previous research fails to indicate internal reliability estimates.

A second instrument was created to directly assess students' gestalt perceptions of their learning style preferences. Four semantic differential scales measured active/passive learning and concrete/abstract learning preference (see Table 1).

The third instrument consisted of 10 Likert statements designed to reflect the components of the Kolb inventory (see Table 2).

Statistical Analysis

All reported internal reliability estimates are based on Nunnally's coefficient alpha. The first research question was examined by a correlation analysis and multiple discriminant analysis. Hypothesis 1 was examined with a canonical correlation analysis followed by a series of correlation analyses. Hypothesis 2 utilized multiple discriminant analysis, and the percentage of cases classified correctly is reported.

All tests of significance were set at the .05 level.

Results

Reliabilities for instruments were as follows: communication apprehension, .79; shyness, .82; unwillingness to communicate, .90; tolerance for disagreement, .88; and generalized immediacy, .94. Communicator style subconstructs were: open, .60; friendly, .66; effective communicator, .78; animated, .78; impression-leaving, .84; relaxed, .60; attentive, .70; dominant, .83; dramatic, .75; and contentious, .77.

Internal reliability estimates were computed for each of the four components of the Kolb Learning Style Inventory. They were: concrete experience, .39; reflective observation, .61; abstract conceptualization, .46; and active experimentation, .54.

Factor analysis of the four-item generalized learning style inventory demonstrated a clear two-factor solution, with the active/passive dimension internally reliable at .77 and the abstract/concrete dimension at .80 (see Table 1).

Factor analysis of the 10-item learning style preference instrument revealed four dimensions similar to the Kolb categories, with the following internal reliabilities: active participation, .74; isolated orientation, .60; directed involvement, .62; and generalized focus, .55 (see Table 2).

Research question 1 examined the relationship between Kolb's four learning abilities and learning style as measured by the newly created instruments. The active/passive semantic differential scores were significantly correlated with reflective observation scores (-.14) and active orientation scores (.23). This was exactly as expected, although the magnitude of the correlations was lower than expected. The abstract/concrete semantic differentials were not significantly correlated with concrete experience but were with abstract conceptualization (.12). They were also correlated .15 with active experimentation, a dimension assumed in Kolb's system to be a separate axis.

Only one of the four dimensions of the general learning style inventory was significantly correlated with Kolb's abilities. The active participation scale score correlated .27 with active experimentation and -.25 with reflective observation.

These results together suggest that the active/passive continuum of the Kolb instrument is operating in a valid way but that the concrete/abstract continuum is more obscure and perhaps less reliably and validly measured.

A multiple discriminant analysis using a linear composite of the six newly created scales to predict Kolb's four categories of learning style correctly classifies 41% of the cases. Assimilators are classified the most accurately, and convergers are classified next best (see Table 3).

Hypothesis 1 was supported. Three significant canonical correlations were demonstrated. Communication predisposition and behavior variates significantly correlated .69, .43, and .34 with the learning style preference variates. The largest contributors to the first canonical variable were immediacy (.83), unwillingness to communicate (.79), and active involvement (.82) and active/passive (.78). The second canonical variable was most associated with open (.54) and communication apprehension (.49) and directed involvement (.77). The vector for the third canonical variable was most influenced by dominant (.54), impression-leaving (.53), and relaxed (.52) and reflective observation (see Table 4).

An examination of the raw correlations between each of the Kolb learning abilities and the communication variables revealed the following significant correlations. Immediate (.10), impression-leaving (.10), attentive (.10), and dramatic (.11) communication behaviors were associated with concrete experiential learning preference. Abstract conceptualization was only significantly associated with lower communication apprehension (.10).

People high in reflective observation learning ability were high in communication apprehension (.18), low in verbal activity (.22), and high in unwillingness to communicate (.20). Their ability to tolerate disagreement was less (.18), and they were lower in immediacy (.19), openness (.15), effective communication (.19), expressiveness (.16), impression-leaving (.15), relaxation (.16), dominance (.21), and dramatic (.21) communication styles. Active experimentation was significantly correlated with lower communication apprehension (.11), more willingness to communicate (.30), and greater verbal activity (.12). Higher immediacy (.28), friendliness (.16), effective communication (.17), expressiveness (.20), and attentiveness (.11) were also associated with active experimentation learning preference.

The active/passive semantic differential scales (with active being a higher score) were associated with lower communication apprehension (.30), greater willingness to communicate (.42), and reduced verbal activity (.24). Their ability to tolerate disagreement was higher (.12). They are also more immediate (.48), open (.12), friendly (.25), effective (.26), expressive (.32), impression-leaving (.13), attentive (.31), and dramatic (.13). The concrete/abstract semantic differential scales demonstrated greater abstractness to be correlated with more tolerance for disagreement (.11) and less immediate (.24), impression-leaving (.12), and attentive (.11) communicator styles.

The four dimensions of the generalized learning styles inventory were also associated with communication variables. The active involvement dimension significantly correlated with all of the communication variables. Greater preference for active involvement was related to lower communication apprehension (.43), greater willingness to communicate (.46), greater verbal activity (.35), more tolerance for disagreement (.19), and more immediate (.41), open (.29), friendly (.32), effective (.40), expressive (.33), impression-leaving (.24), relaxed (.16), attentive (.33), dominant (.18), dramatic (.11), and contentious (.12) communicator styles. Preference for an isolated orientation was only related to an impression-leaving style (.10).

Preference for directed involvement (concrete directions) in a learning task was associated with an open (.15) and a dominant (.13) communication style and negatively associated with an immediate (.15), friendly (.14), expressive (.11), impression-leaving (.11), and attentive (.12) communication style. Preference for a generalized focus (more abstract directions) was negatively associated with communication apprehension (.11) and positively associated with immediacy (.12), effective communication (.16), and impression-leaving (.10).

Hypothesis 2 was confirmed. A linear combination of communication predispositions and behaviors correctly classified 61% of the cases into the correct learning styles category (see Table 5). Several additional multiple discriminant analyses were performed to better ascertain the discriminating functions. The most enlightening one used communication anxiety/activity predispositions to predict learning style. Only 37% of the cases were correctly classified, but, more interestingly, the linear composite classified no subjects as divergers or accommodators (see Table 6).

Discussion

The Kolb LSI needs much empirical validation before it becomes widely accepted as an appropriate categorical scheme. The internal reliability for each dimension is low, and this will negatively affect predictive validity.

The instrument score itself is based on a total of rank orderings of descriptive adjectives for each of the four learning dimensions. Yet there are 12 adjectives which are not part of any total. These 12 rankings contribute to measurement error in a very unsystematic way. There may be two, three, or four raw possibilities which have an effect on whether an individual descriptor receives a ranking of one, two, three, or four. If an irrelevant descriptor affects a subject's choice such that a relevant descriptor is ranked two when it would have been ranked one if the irrelevant descriptor were not present, the irrelevant descriptor seriously reduces the internal reliability estimates for the learning dimension.

Furthermore, the descriptors of concrete and abstract appear in the same row as the descriptors observing and active. The rankings for observing and active contribute to the learning style totals of reflective observation and active experimentation, respectively, but concrete and abstract are scored as irrelevant descriptors. This leads to serious questioning of the face validity for the instrument. Surely the descriptors concrete and abstract are not irrelevant descriptors for concrete experience and abstract conceptualization learning styles.

This concern is further supported by the data from the newly created learning styles instruments in this study, which suggest that the active/passive axis of Kolb's instrument is operating with more face validity than the abstract/concrete axis.

Few communication variables were associated with the abstract/concrete learning styles axis. However, immediate, impression-leaving, attentive, and dramatic communicator styles were significantly associated with concrete experiential learning style, and these results are intuitively appealing. These communication behaviors are more representative of a concrete communication style, and it may be that a concrete communication style is associated with preference for a concrete learning style. As a caution, the associations were quite small, only accounting for about 1% shared variance. This low but significant relationship suggests a potential direction for future research, but any conclusions at this point are highly premature.

The abstract conceptualization dimension is even less informative about communication behaviors or predispositions which may be related, with communication apprehension being the only significantly related variable. Again, much more psychometric attention needs to be directed toward the abstract/concrete axis of the LSI before any predictive associations are interpreted.

The active/passive axis of the LSI is operating more reliably and is also more informative about related communication variables. In fact, lower levels of communication anxiety and greater desires for communication involvement were positively associated with an active experimentation learning style and negatively associated with a reflective observation style. Furthermore, active learning styles were also associated with more active communication styles (more immediacy, friendliness, expressiveness, attentiveness, and overall effectiveness). The more reflective learner was less immediate, open, expressive, impression-leaving, relaxed, dominant, dramatic, and effective as a communicator.

These findings as well as the similar relationships demonstrated with the newly created learning style instruments suggest that an active/passive learning style is indeed associated with an active/passive communication style. Again, however, the relationships are not as large as one would like. Communication variables only account for about 4% shared variance with the LSI dimensions and only about 9% with the other learning style instrument scores. Since moderate learning style instrument reliabilities may be reducing the potential relationship, more psychometric work on learning style instrumentation is strongly recommended before conclusions are reported and disseminated.

In spite of instrumentation problems (problems which are particularly large with one classification axis), the classification scheme of the LSI is fairly well predicted by a linear composite of communication variables. This suggests a potential underlying relationship between communication variables and learning style categorization which needs much greater conceptual and empirical exploration. It is possible that one's communication predisposition and styles play a determining role in one's selection of learning style.

If this is true, teaching students alternate communication behaviors may provide them with the flexibility to alter learning style when appropriate. It may be that a narrow range of communication abilities may necessarily limit one to a singular learning style preference. A flexible communicator may be the person Kolb idealizes as one who can choose among learning styles, selecting the most appropriate one for the topic and environment rather than being forced into employing a habitual but inadequate learning style.

This implication is exciting for future research in communication as well as in learning style. It was hoped that this study would lay the groundwork for this kind of future exploration. Unfortunately, the results of this study are tainted by inadequate instrumentation reliability for the learning style construct. When measurement is improved for learning style, the relationship between learning style and communication predispositions and behavioral styles needs to be re-examined. The nature of this relationship can then suggest practical and theoretical implications for the operation and importance of the learning style in educational systems.

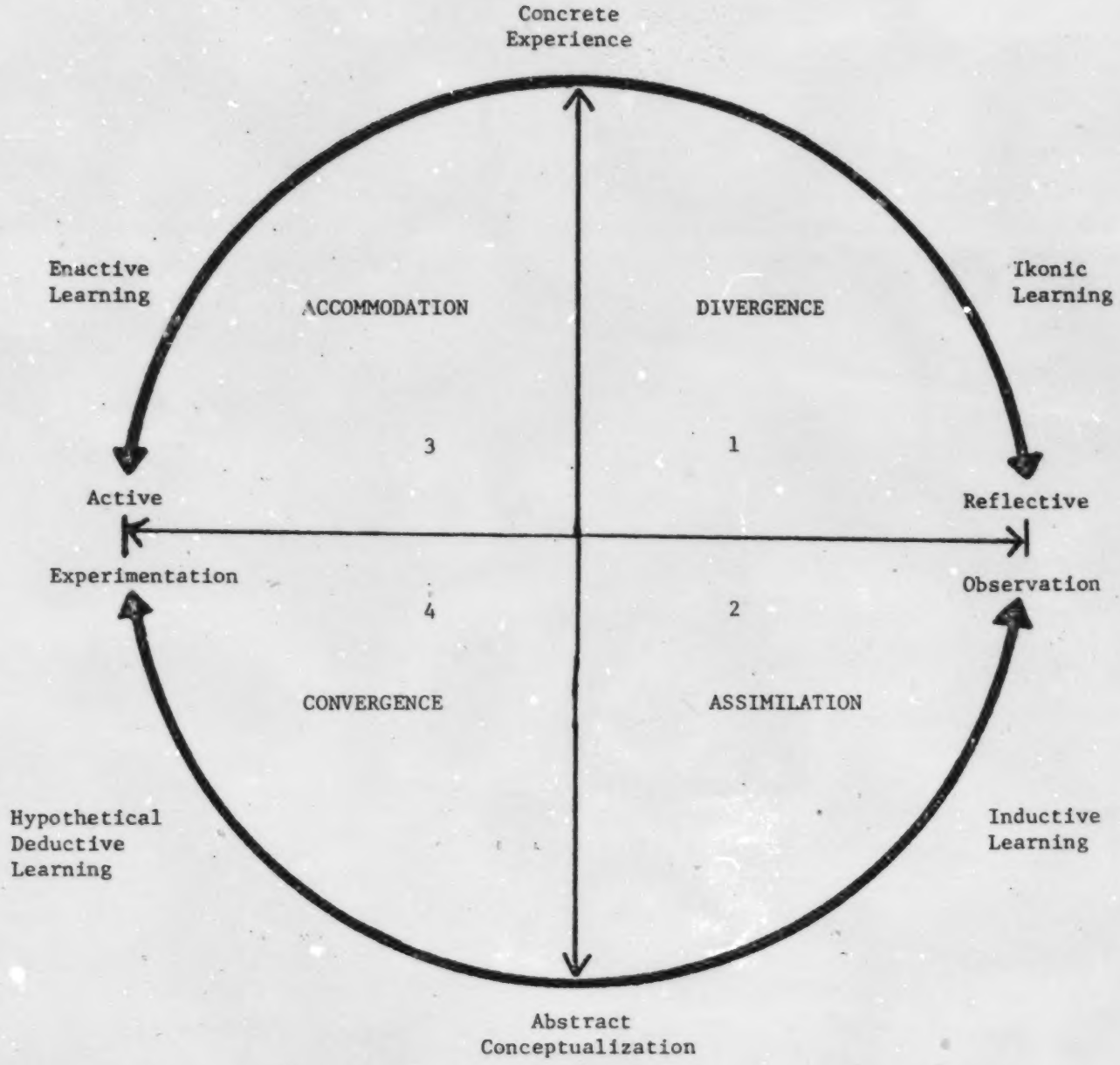

Figure 1. KOLB'S EXPERIENTIAL LEARNING MODEL
(Lemoine & Rasberry, 1980)

Table 1

Oblique Two-Factor Solution
for Generalized Learning Style Inventory

Items							Factor 1, Concrete/Abstract	Factor 2, Passive/Active
concrete	1	2	3	4	5	abstract	-.91*	.09
passive	1	2	3	4	5	active	-.03	.89*
abstract	1	2	3	4	5	concrete	.85*	.10
active	1	2	3	4	5	passive	-.03	-.86*

*Indicates that item was considered to be loaded on that factor.

Table 2

Oblique Four-Factor Solution
for Learning Style Preference Instrument

Item	Factor 1, Active Participation	Factor 2, Isolated Orientation	Factor 3, Directed Involvement	Factor 4, Generalized Focus
I like to be actively involved in learning.	-.57*	.16	-.19	.05
I prefer to learn by sitting back and listening to someone teach me.	.72*	.12	-.15	.07
I learn best by doing rather than listening.	.67*	.27	-.09	.17
I like to learn working quietly by myself.	.36	.72*	-.13	.06
I like to learn by actively solving problems working in a group.	-.67*	-.22	-.00	-.01
I learn best when someone gives me exact instructions for an assignment.	-.10	.17	-.75*	.04
I prefer a general assignment that I can work out the details for.	.03	.23	.40	.62*
I learn best by solving problems on my own.	-.24	.81*	.06	-.20
I learn best when someone demonstrates exactly how to do something.	.05	-.10	-.79*	-.06
I learn best when someone gives me a general idea of how to do something.	-.07	-.25	-.15	.87*

*Indicates that the item was considered to be loaded on that factor.

Table 3

Multiple Discriminant Analysis
Using Scores on Newly Created Learning Style Instruments
to Predict Kolb's Learning Styles

From		Cases Classified into (1)	(2)	(3)	(4)
Divergers	(1)	17*	34	2	20
Assimilators	(2)	10	61*	7	31
Accommodators	(3)	5	27	7*	31
Convergers	(4)	7	32	3	57*

*Indicates correct classification.

Table 4

Canonical Correlation Analysis

Variables	First Canonical Variable	Second Canonical Variable	Third Canonical Variable
COMMUNICATION VARIABLES*			
Communication apprehension	.60	-.49	.27
Verbal activity	.50	-.21	.27
Unwillingness to communicate	.79	-.18	-.16
Tolerance for disagreement	-.22	.38	-.37
Immediacy	-.83	-.23	-.04
Communication style:			
Open	.34	-.54	.24
Friendly	.52	.21	-.05
Effective communicator	.60	-.15	.35
Animated	.59	.05	.01
Impression-leaving	.37	.23	.53
Relaxed	.22	.13	.52
Attentive	.59	.18	.05
Dominant	.24	-.32	.54
Dramatic	.22	-.02	.29
Contentious	.12	.11	.46
LEARNING STYLE VARIABLES**			
Concrete experience	.09	.28	.12
Reflective observation	-.30	.18	-.58
Abstract conceptualization	.03	-.26	.06
Active experimentation	.44	.01	.27
Active involvement	.82	-.25	.19
Isolated orientation	.04	.31	.12
Directed involvement	.17	.77	-.02
Generalized focus	.21	-.08	.26
Concrete/abstract	.28	.27	.17
Active/passive	.78	-.22	-.21

(continued)

Table 4 (continued)

	First Canonical Variable	Second Canonical Variable	Third Canonical Variable
CANONICAL CORRELATION BETWEEN GROUPS	.69	.43	.34
CHI-SQUARE	460.08	221.49	146.87
SIGNIFICANCE LEVEL	<.001	<.001	<.004

*The negative correlations for communication variables are a function of instrument scoring. Higher scores mean more communication apprehension, less verbal activity, more unwillingness to communicate, more tolerance for disagreement, and more immediacy and less of all of the communication style variables.

**A high score on Kolb's styles (concrete experience, reflective observation, abstract conceptualization, and active experimentation) indicates less of these orientations. Higher scores on active involvement, isolated orientation, directed involvement, and generalized focus also indicate less preference for the label. Abstract and active orientations are reflected in higher scores in the semantic differential scales.

Table 5

Multiple Discriminant Analysis
Using Linear Combination
of Communication Behaviors and Predispositions
to Predict Kolb's Learning Styles

From		Cases Classified into (1)	(2)	(3)	(4)
Divergers	(1)	41*	10	7	13
Assimilators	(2)	14	61*	5	20
Accommodators	(3)	4	7	35*	21
Convergers	(4)	5	17	9	68*

*Indicates correct classification.

Table 6

Multiple Discriminant Analysis
Using Linear Composite
of Communication Anxiety/Activity Predispositions
to Predict Kolb's Learning Styles

From		Cases Classified into (1)	(2)	(3)	(4)
Divergers	(1)	0	51	0	25
Assimilators	(2)	0	62*	0	44
Accommodators	(3)	0	27	0	43
Convergers	(4)	0	37	0	70*

*Indicates correct classification.

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